

- 23 -

C L A I M S

1. Elongated shaped particle comprising two protrusions each extending from and attached to a central position, wherein the central position is aligned along the longitudinal axis of the particle, the cross-section of the particle occupying the space encompassed by the outer edges of six circles around a central circle, each of the six circles touching two neighbouring circles whilst two alternating circles are equidistant to the central circle and may be attached to the central circle and the two circles adjacent to the two alternating circles (but not the common circle) touching the central circle, minus the space occupied by the four remaining outer circles and including four remaining interstitial regions.

2. Elongated shaped particle, comprising one to four additional protrusions, preferably one or two additional protrusions, each attached to an existing endstanding protrusion as defined in claim 1, the additional protrusion being defined in the same way as in claim 1, the existing endstanding protrusion becoming the new central circle, the original central circle becoming the other protrusion.

3. Elongated shaped particle according to claims 1 or 2, having a cross-section in which the two remaining alternating circles and, if present, the additional protrusions have diameters in the range between 0.74 and 1.3 times the diameter of the central circle as defined in claim 1, preferably between 0.87 and 1.15 times the diameter of the central circle as defined in claim 1.

- 24 -

4. Elongated shaped particle according to claims 1 to 3,  
in which the angle between the two lines connecting the  
centers of the two remaining circles and the central  
circle is between  $90^\circ$  and  $180^\circ$  or between  $270^\circ$  and  $180^\circ$ ;  
5 preferably between  $110^\circ$  and  $150^\circ$  or between  $210^\circ$  and  
 $250^\circ$ , more preferably  $120^\circ$  or  $240^\circ$ .

5. Elongated shaped particle according to claims 1 to 4,  
having a cross-section in which the two remaining  
alternating circles and, if present, the additional  
10 protrusions have the same diameter as the central circle  
as defined in claim 1, preferably elongated shaped  
particle, in which the two alternating circles and, if  
present, the additional protrusions are attached to the  
central circle as defined in claim 1, or, if applicable,  
15 claim 2.

6. Elongated shaped particle according to claims 1 to 5,  
having a L/D ratio (mm/mm), wherein D is the diameter of  
the central circle as defined in claim 1, of between 1  
and 25, preferably between 2 and 10, or elongated shaped  
20 particle according to claims 1 to 5 having a length in  
the range between 0.5 and 15 mm, preferably between 1  
and 5 mm.

7. Shaped catalyst or catalyst precursor containing a  
catalytically active component or a precursor therefore,  
25 supported on a carrier, which carrier is an elongated  
shaped particle according to claims 1 to 6.

8. Shaped catalyst or catalyst precursor according to  
claim 7, wherein the component is selected from elements  
of Group VIII of the Periodic Table of the Elements,  
30 preferably shaped catalyst or catalyst precursor wherein  
the Group VIII element is Fe, Co or Ni, preferably Co.

9. Shaped catalyst or catalyst precursor according to  
claim 8, wherein the carrier is a refractory oxide,

- 25 -

preferably silica, alumina or titania, more preferably titania.

10. Shaped catalyst or catalyst precursor according to claim 8 or 9, containing an element or compound selected from Group IIA, IIIB, IVB, VB, VIB, VIIB or VIII of the Periodic Table of the Elements, preferably selected from V, Zr, Mn, Ru, Re, Pt, Pd or Ag.

11. Shaped carrier according to claims 1 to 6 or a catalyst or catalyst precursor according to claims 7 to 10, wherein the carrier or catalyst has been made by extrusion.

12. Process for the preparation of a carrier according to claims 1 to 6 or a catalyst or catalyst precursor according to claims 7 to 10, by pressing, extruding or otherwise forcing a granular or powdered catalyst or catalyst precursor material into various shapes under certain conditions, which will ensure that the particle retains the resulting shape, both during reaction as well as regeneration, preferably by extrusion.

13. Die-plate designed for use in the preparation of a carrier or a catalyst or catalyst precursor according to claim 11, wherein the die-plate comprises one or more orifices in the shape of the cross-section of the carrier particles as defined in any of the preceding claims.

14. Process for the preparation of hydrocarbons by contacting a mixture of carbon monoxide and hydrogen with a catalyst as described in claims 7 to 11, the catalyst being optionally activated.

15. Process for the preparation of fuels and base oils from the hydrocarbons described in claim 14, by hydrogenation, hydroisomerisation and/or hydrocracking.